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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/528,282	03/17/2000	Yonezo Furuya	109A 2948	4121

7590

05/07/2003

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EXAMINER

SHAPIRO, JEFFERY A

ART UNIT

PAPER NUMBER

3653

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/528,282

Applicant(s)

FURUYA, YONEZO

Examiner

Jeffrey A. Shapiro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 11/25/02 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/528,282 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Martin et al, US 6,196,371 B1 (referred to as "Coinstar" in the prior action). Martin et al discloses the coin inspection apparatus as follows.

As described in Claims 1,6, 11, 16 and 27;

1. an exciting coil (see figure 2a, 2b,2c and 2d, for example) arranged in the vicinity of one side of a coin passage;
2. a receiving coil (see figures 5, 6 and 11a) arranged in the vicinity of said one side of said coin passage so as to be electromagnetically coupled with said exciting coil;
3. oscillation means (1152a and b) for exciting and oscillating said exciting coil at a predetermined frequency to produce an electromagnetic field;

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4. first detecting means (see figure 55c) for detecting at least one of amplitude, frequency and phase of an oscillation voltage of said exciting coil;
5. second detecting means (see figure 55c, sensors 4546a, b or c) for detecting an electromotive force signal generated in said receiving coil;
6. discriminating means (see figures 36, 37 and 38) for discriminating authenticity of the thrown coin based on detection from said first and second detecting means;
- 6b. *discriminating authenticity based on a combination of an electromotive force signal (4544a, b or c) detected by said receiving coil (45446a-c) and amplitude, frequency or phase of an oscillation voltage of said exciting coil (see figure 55c, for example);*

As described in Claims 2, 7, 12 and 19;

7. said predetermined frequency is set in accordance with material of the coin to be discriminated (see figure 35b);

As described in Claims 3, 8, 13 and 20;

8. said discriminating means determines material of the thrown coins based on the amplitude of the oscillation voltage of said exciting coil (see figure 35b);

As described in Claims 4, 9, 14 and 25;

9. said discriminating means samples said electromotive force signal in a *time* period, and performs a statistical process based on the sampled values to determine a feature of the thrown coin (see figure 37);

As described in Claims 10, 15 and 26;

10. said statistical process is performed by obtaining a coefficient of correlation of said sampled values with respect to a reference coin, and discriminating the thrown coin based on magnitude of said correlation coefficient (see figure 55d);

As described in Claims 5, 6, 13, 16 and 27;

11. two receiving coils having substantially identical characteristics and arranged in the vicinity of said one side of said coin passage so that said receiving coils are electromagnetically coupled with said exciting coil (see figures 56a-56h);

12. discriminating authenticity of the coin based upon at least one of amplitude, frequency and phase of oscillation voltage of said exciting coil, and an electromotive force signal *influenced by a reactive magnetic field caused by eddy currents induced on a surface of the coin when the coin passes through said electromagnetic field* and detected by said two receiving coils (note that Martin et al discloses determining surface irregularities and properties near the surface of the coin as well as properties for different regions of a coin—see col. 2, lines 15-23);

As described in Claims 17 and 27;

12. said first detecting means includes a first detector circuit for outputting a direct voltage signal corresponding to the oscillation voltage of said exciting coil (see figures 31a-31i);

As described in Claims 18 and 27;

13. said second detecting means comprises a bridge circuit including said two receiving coils, a differential amplifier circuit for amplifying an alternating voltage signal outputted from said bridge circuit and outputting the amplified signal, and a second detector circuit for detecting and rectifying the alternating voltage signal from said differential amplifier circuit and converting the same into a direct voltage signal corresponding to the output of said bridge circuit (see figure 12);

As described in Claims 21-23;

14. said exciting coil is arranged at a predetermined distance from said receiving coils so that a line connecting the center of magnetic poles of said exciting coil is substantially **parallel or perpendicular** with an extending direction of said coin passage, and two receiving coils are arranged above a coin rail provided with said coin passage so that a line connecting centers of said two receiving coils is substantially **parallel or perpendicular** with an extending direction of said coin passage (see figures 2c and 3);

As described in Claims 6 and 24;

15. said coin passage (2121a) is formed so that a coin passing therethrough is inclined to said one side of said coin passage where said exciting coil and said receiving coils are arranged (see figure 21);

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin et al in view of Rawicz-Szczerbo et al.
6. Claims 1-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Martin et al. Martin et al discloses the coin inspection apparatus as follows.

As described in Claims 1,6, 11, 16 and 27;

1. an exciting coil (see figure 2a, 2b,2c and 2d, for example) arranged in the vicinity of one side of a coin passage;
2. a receiving coil (see figures 5, 6 and 11a) arranged in the vicinity of said one side of said coin passage so as to be electromagnetically coupled with said exciting coil;
3. oscillation means (1152a and b) for exciting and oscillating said exciting coil at a predetermined frequency to produce an electromagnetic field;

4. first detecting means (see figure 55c) for detecting at least one of amplitude, frequency and phase of an oscillation voltage of said exciting coil;
5. second detecting means (see figure 55c, sensors 4546a, b or c) for detecting an electromotive force signal generated in said receiving coil;
6. discriminating means (see figures 36, 37 and 38) for discriminating authenticity of the thrown coin based on detection from said first and second detecting means;
- 6b. *discriminating authenticity based on a combination of an electromotive force signal (4544a, b or c) detected by said receiving coil (45446a-c) and amplitude, frequency or phase of an oscillation voltage of said exciting coil (see figure 55c, for example);*

As described in Claims 2, 7, 12 and 19;

7. said predetermined frequency is set in accordance with material of the coin to be discriminated (see figure 35b);

As described in Claims 3, 8, 13 and 20;

8. said discriminating means determines material of the thrown coins based on the amplitude of the oscillation voltage of said exciting coil (see figure 35b);

As described in Claims 4, 9, 14 and 25;

9. said discriminating means samples said electromotive force signal in *a time* period, and performs a statistical process based on the sampled values to determine a feature of the thrown coin (see figure 37);

As described in Claims 10, 15 and 26;

10. said statistical process is performed by obtaining a coefficient of correlation of said sampled values with respect to a reference coin, and discriminating the thrown coin based on magnitude of said correlation coefficient (see figure 55d);

As described in Claims 5, 6, 13, 16 and 27;

11. two receiving coils having substantially identical characteristics and arranged in the vicinity of said one side of said coin passage so that said receiving coils are electromagnetically coupled with said exciting coil (see figures 56a-56h);

12. discriminating authenticity of the coin based upon at least one of amplitude, frequency and phase of oscillation voltage of said exciting coil, and an electromotive force signal *influenced by a reactive magnetic field caused by eddy currents induced on a surface of the coin when the coin passes through said electromagnetic field* and detected by said two receiving coils;

As described in Claims 17 and 27;

12. said first detecting means includes a first detector circuit for outputting a direct voltage signal corresponding to the oscillation voltage of said exciting coil (see figures 31a-31i);

As described in Claims 18 and 27;

13. said second detecting means comprises a bridge circuit including said two receiving coils, a differential amplifier circuit for amplifying an alternating voltage signal outputted from said bridge circuit and outputting the amplified signal, and a second detector circuit for detecting and rectifying the alternating voltage signal from said differential amplifier circuit and converting the same into a direct voltage signal corresponding to the output of said bridge circuit (see figure 12);

As described in Claims 21-23;

14. said exciting coil is arranged at a predetermined distance from said receiving coils so that a line connecting the center of magnetic poles of said exciting coil is substantially **parallel or perpendicular** with an extending direction of said coin passage, and two receiving coils are arranged above a coin rail provided with said coin passage so that a line connecting centers of said two receiving coils is substantially **parallel or perpendicular** with an extending direction of said coin passage (see figures 2c and 3);

As described in Claims 6 and 24;

15. said coin passage (2121a) is formed so that a coin passing therethrough is inclined to said one side of said coin passage where said exciting coil and said receiving coils are arranged (see figure 21);

Martin et al does not expressly disclose details of using eddy currents to detect surface patterns of coins.

Rawicz-Szczerbo et al discloses using eddy currents to detect surface patterns of coins.

Both Martin et al and Rawicz-Szczerbo et al are analogous art as they both disclose coin discrimination using induction coils.

At the time of the invention, it would have been obvious to use the induction coils of the device of Martin et al to detect surface patterns of coins by inducing eddy currents by one coil and detecting the resulting frequencies by another coil.

The suggestion/motivation would have been to determine a surface pattern embossed on the coin. See Rawicz-Szczerbo et al, col. 4, lines 2-23. See also Fougere, col. 3, lines 35-41, further indicating such a scheme is well-known in the art.

Therefore, it would have been obvious to combine Martin et al and Rawicz-Szczerbo et al to obtain the invention as specified in Claims 1-27.

Terminal Disclaimer

7. The terminal disclaimer filed on 11/25/02 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US

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Patent 6,325,197 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

8. Applicant's arguments filed 11/25/02 have been fully considered but they are not persuasive. Applicant asserts that the Martin et al reference fails to disclose "detecting an electromotive force affected by a reactive magnetic field caused by eddy currents induced on a surface of the coin using receiving coils so as to detect the surface pattern of the coins.

The device of Martin et al discloses a first core (1142a) and coil (1144a) and a second core (1142b) and coil (1144b). These cores and coils send out a magnetic field which is altered by the coin as it passes by. The magnetic field, or eddy currents detected from the coin are resultant from the fields produced by the induction coils. The resulting change in eddy currents is then detected by the processor (294) which compares this frequency with a reference frequency to obtain the difference with results recorded as in 16a or 16b, for example. In effect, the induction coils produce an electromotive force which becomes a magnetic field or eddy currents. The magnetic field is altered when the coin passes by the coils. This new, altered field is then detected by the coils and the change recorded and compared with reference data. Therefore, the original electromotive force is altered by the reactive magnetic field caused by the eddy currents created by the coin. These eddy currents are indicative of surface properties and therefore surface patterns of particular coins. See Martin et al (US 6,196,371 B1), col. 2, lines 7-22. Note also Martin et al, col. 5, lines 14-16 which

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mentions eddy currents. Note also Martin et al (US 5,988,348), col. 50, lines 21-67 and col. 51-36. Again, as cited above, Rawicz-Szczerbo et al discloses using eddy currents to obtain surface patterns using induction coils. See col. 4, lines 4-23.

Note also that it appears that nowhere in the claims is there a recitation that both the excitation and receiving coils are separate coils. Even if they are not separate coils in the system of Martin et al or Rawicz-Szczerbo et al, it can be argued that they are functional equivalents.

Therefore, as the prior art appears to read on Claims 1-27, as currently written, the rejections based upon the prior art are considered to be valid.

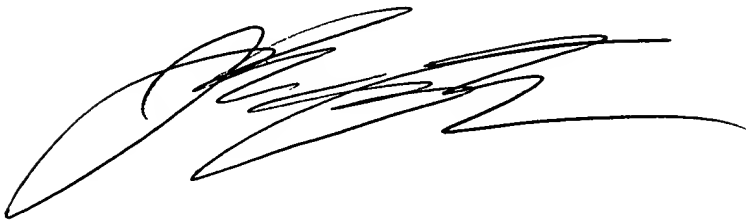
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey A. Shapiro whose telephone number is (703)308-3423. The examiner can normally be reached on Monday-Friday, 9:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald P. Walsh can be reached on (703)306-4173. The fax phone numbers for the organization where this application or proceeding is assigned are (703)306-4195 for regular communications and (703)306-4195 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1113.

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Jeffrey A. Shapiro
Patent Examiner,
Art Unit 3653

May 5, 2003



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